

Supplementary Online Content

Szilagyi PG, Humiston SG, Stephens-Shields AJ, et al. Effect of training pediatric clinicians in human papillomavirus communication strategies on human papillomavirus vaccination rates: a cluster randomized clinical trial. *JAMA Pediatrics*. Published online May 24, 2021. doi:10.1001/jamapediatrics.2021.0766

eAppendix 1. Weekly Text Message (or Email if Requested) “Quick Tips” Designed to Reinforce the Content of the Educational Modules

eAppendix 2. Percentage of Adolescent Office Visits at Which a Missed Opportunity (MO) Occurred by Study Group Over: a) All Eligible Visits and b) by Visit Type (Well-Child Care or Acute/Chronic)

eAppendix 3. Percentage of Adolescents Who Received an Initial Dose or Subsequent HPV Vaccine Dose (Month-Matched by Period, and Clustered by Site) Among Adolescents Who Were Eligible to Receive an Initial or Subsequent HPV Vaccination

This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix 1. Weekly Text Message (or Email if Requested) “Quick Tips” Designed to Reinforce the Content of the Educational Modules

Practice what you've learned from the STOP-HPV module with a colleague. Then use it with parents.
Are you giving the HPV recommendation from the Module 1-same way, same day as other vaccines? "Sam needs 3 vaccines TODAY: Tdap, HPV, and meningitis."
HPV vaccine is as safe as all other vaccines you give. (>12 year US rack record of safety)
Almost everyone will be infected with HPV at some time. Do providers in your group think HPV vaccine is only important for "high-risk" kids?
Why vaccinate at 11-12 years? Because HPV vaccine works better at a younger age.
It is safe to vaccinate during acute visits. An adolescent's cold, sore throat, diarrhea, etc. won't increase the risk of a vaccine side effect.
What will you do to STOP-HPV this week? 1) Practice same way, same day introduction; 2) Know the facts; 3) Be sure your team is on board!
Train staff to answer questions about HPV vaccine by saying: "We're all about cancer prevention. I'll ask the Dr to talk to you about your concerns."
Involve your office staff in STOP-HPV: At HPV dose 1 visit, schedule patient for dose 2 before leaving the office.
Practice the skills you learned from the Module 3 for managing hesitancy. Practice with a colleague, then with parents.
If a parent asks a question about HPV vaccine, remember: Listen, reflect back, and ask permission to give your perspective.
Hear hesitant parents and affirm. If they decline, remind them you'll bring up HPV vaccination at the next visit.
HPV vaccination discussions are about cancer prevention, not sex.
Don't be discouraged by a "negative encounter" over HPV vaccine. Continue to use the strategies you've learned. Many families will be receptive.
Vaccinate both boys and girls. Oral HPV-related cancer is increasing.
A strong provider recommendation is a significant predictor of HPV vaccination. Families value your advice.
Great news: HPV vaccination is associated with lower oral HPV prevalence among young US adults. Whose cancer did you prevent today?
Explain to your team: HPV vaccination should be universal- not targeted. Almost everyone will be exposed to the virus at some point in their life.
Have a good HPV hand-out ready for parents. Check out the printable resources from the CDC https://www.cdc.gov/vaccines/partners/teens/fact-sheets.html
Don't delay vaccination. Teens who begin the HPV vaccine series BEFORE age 15 years only need two doses.
9-out-of-10 men and 8-out-of-10 women will be infected with HPV at some point in their lives. Vaccinate today.
When recommending the vaccine, try saying: "I would (did) have my child/family member vaccinated with HPV vaccine."
Improving HPV vaccine communication takes practice. Practice with your colleagues and give each other feedback.
Let families know what vaccines teens need, don't make HPV vaccine sound optional.
When you put off HPV vaccination, you don't know when kids will return. Vaccinate today!

eAppendix 2. Percentage of Adolescent Office Visits at Which a Missed Opportunity (MO) Occurred by Study Group Over: a) All Eligible Visits and b) by Visit Type (Well-Child Care or Acute/Chronic)

n and dose (initial or subsequent) for the baseline and intervention periods (visit-level analysis).

* A reduction in MOs represents an improvement.

Appendix 2a: Overall visits and doses

Percent of Office Visits with a Missed Opportunity for HPV Vaccination – Overall Visits and Doses			
Group	Baseline Period	Intervention Period	Percentage Point Change in MOs (95% CI)
Intervention Group	73.7% (37,063 / 51,339)	70.7% (14,932 / 21,033)	-3.0%
Control Group	72.8% (40,764 / 55,502)	72.2% (18,343 / 24,829)	-0.6%
Intervention vs Control Groups			-2.4% (-3.5%, -1.2%)

*Percentages are adjusted for dose and visit type. Numerator and denominator counts are unadjusted.

Appendix 2b: Well-child care visits and acute/chronic visits

Percent of Office Visits with a Missed Opportunity for HPV Vaccination Well-Child Care Visits and Acute/Chronic Visits						
	Initial HPV Vaccine Dose			Subsequent HPV Vaccine Dose		
Visit Type	Baseline Period	Intervention Period	Percentage Point Change in MOs (95% CI)	Baseline Period	Intervention Period	Percentage Point Change in MOs (95% CI)
Well-Child Care						
Intervention Group	57.5% (10,290/17,894)	48.7% (3,129/6,421)	-8.8%	13.8% (852/6,186)	10.0% (247/2,473)	-3.8%
Control Group	55.0% (10,069/18,305)	53.0% (3,976/7,499)	-2.0%	10.3% (598/5,826)	8.9% (232/2,593)	-1.3%
Intervention vs Control Groups			-6.8% (-9.7%, -3.9%)			-2.5% (-5.5%, 0.5%)
Acute/Chronic						
Intervention Group	98.3% (19,833/20,179)	97.9% (8,371/8,547)	-0.3%	86.0% (6,088 / 7,080)	88.7% (3,185/3,592)	+2.7%
Control Group	98.4% (23,336/23,612)	98.1% (10,545/10,753)	-0.3%	88.6% (6,871/7,759)	90.1% (3,590/3,984)	+1.6%
Intervention vs Control Groups			0 (-0.7%, 0.6%)			+1.1% (-1.5%, 3.7%)

*The denominator in these analyses is all office visits by adolescents 11-17 years of age during the relevant study period (baseline or intervention) who were eligible for an HPV vaccination. The numerator is all office visits by these adolescents who did not receive an HPV vaccination (i.e., a missed opportunity)

eAppendix 3. Percentage of Adolescents Who Received an Initial Dose or Subsequent HPV Vaccine Dose (Month-Matched by Period, and Clustered by Site) Among Adolescents Who Were Eligible to Receive an Initial or Subsequent HPV Vaccination (person-level analysis).* Both the Baseline and Intervention Periods were 6-months in duration.**

Percent of Adolescents who Received Initial or Subsequent HPV Vaccine Doses Among Adolescents Eligible to Receive an HPV Vaccination						
	Initial HPV Vaccine Dose			Subsequent HPV Vaccine Dose		
	Baseline Period	Intervention Period	Percentage Point Change in Vaccination (95% CI)	Baseline Period	Intervention Period	Percentage Point Change in Vaccination (95% CI)
Total (11-17 years)						
Intervention Group	26.4% 3,145/11,905	32.1% 3,443/10,737	+5.6%	55.5% 2,526/4,553	57.1% 2,629/4,602	+1.6%
Control Group	27.2% 3,598/13,218	29.5% 3,711/12,591	+2.3%	54.3% 2,522/4,643	56.5% 2,750/4,864	+2.2%
Intervention vs Control Groups			+3.4% (0.6%, 6.2%)			-0.6% (-4.1%, 3.0%)
11-12 year olds						
Intervention Group	34.0% 2,318/6,814	41.3% 2,650/6,414	+7.3%	58.0% 1,140/1,966	59.9% 1,379/2,304	+1.9%
Control Group	34.4% 2,732/7,937	38.0% 2,926/7,710	+3.5%	56.8% 1,184/2,085	59.2% 1,451/2,449	+2.5%
Intervention vs Control Groups			+3.8% (0.2%, 7.4%)			-0.6% (-6.1%, 4.9%)
13-17 year olds						
Intervention Group	16.2% 827/5,091	18.3% 793/4,323	+2.1%	53.6% 1,386/2,587	54.4% 1,250/2,298	+0.8%
Control Group	16.4% 866/5,281	16.1% 785/4,881	-0.3%	52.3% 1,338/2,558	53.8% 1,299/2,415	+1.5%
Intervention vs Control Groups			+2.4% (-0.5%, 5.3%)			-0.7% (-5.6%, 4.3%)

* The denominator in these analyses is all adolescents 11.0 to 17 years of age who made a visit during the relevant period and were eligible for an initial or a subsequent HPV vaccination. This denominator is different than the denominator in Table 2. The numerator is all adolescents who made a visit during the

relevant period and received an initial or a subsequent HPV vaccination. We month-matched baseline and intervention periods, and clustered by practice.

** Study Periods: Wave 1 (Baseline=12/26/17 - 6/11/2018; Intervention=12/26/2018 - 6/11/2019); and for Wave 2 (Baseline=2/13/2018 - 7/30/2018; Intervention=2/13/2019 – 7/30/2019)